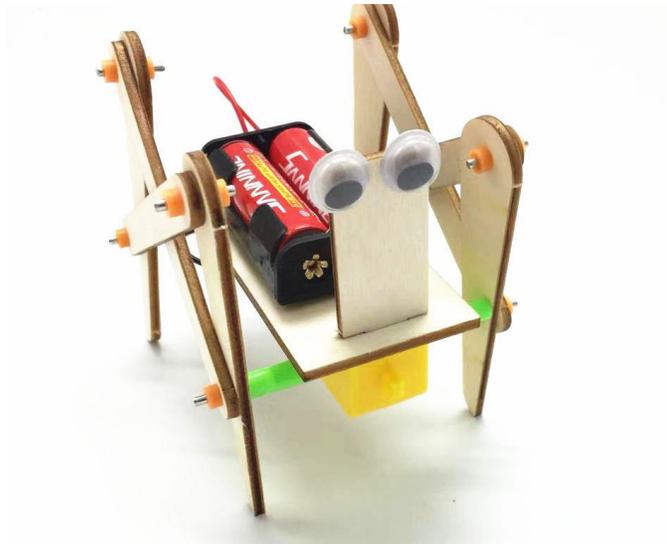


WALKING ROBOT

CAT# 80-50-W060



The Walking Robot Kit is an engaging STEM project that allows students to explore the principles of locomotion, balance, and robotics. From studying Leonardo Da Vinci's sketches to modern robotics like Boston Dynamics, understanding how robots walk helps us comprehend the physics of motion and balance, leading to potential improvements in robotics technology.

PRIMARY DIVISION: GRADES 1-3

Overall Expectation: STEM, Structure and Mechanisms Focus

Explore structures and mechanisms, including the roles of materials in supporting structures and making devices work.

Specific Expectation

Identify and describe the purpose of simple machines such as levers and pulleys.

Activity

Students use the Walking Robot Kit to understand the basic concepts of balance and motion in robots. They explore how the robot's structure affects its ability to walk and experiment with different configurations to achieve stable locomotion. This hands-on activity introduces them to the principles of mechanisms and simple machines.

JUNIOR DIVISION: GRADES 4-6

Overall Expectation: STEM, Matter and Energy Focus

Investigate the principles of forces, energy, and control in simple machines and structures.

Specific Expectation

Explore the relationships between the components of simple machines and the forces acting on them.

Activity

With the Walking Robot Kit, students investigate how forces and balance play a crucial role in robot locomotion. They experiment with different designs and weights to understand how these factors affect the robot's ability to walk steadily. This activity promotes understanding of mechanical principles and the application of force and motion concepts.

INTERMEDIATE DIVISION: GRADES 7-8

Overall Expectation: STEM, Matter and Energy Focus

Investigate how technological problem-solving meets human needs and leads to innovation.

Specific Expectation

Analyze the impact of friction and lubrication on the efficiency of mechanisms.

Activities

Students use the Walking Robot Kit to explore more complex mechanisms involved in walking robots. They analyze the impact of friction on the robot's movement and experiment with lubricants to improve efficiency. Talcum powder can work as a lubricant. This activity fosters problem-solving skills and understanding of mechanical systems.

Students use the Walking Robot Kit to explore more complex mechanisms involved in walking robots. They analyze the impact of the way the legs move. What possible other forms of locomotion are possible, or more realistic. This activity fosters problem-solving skills and understanding of mechanical systems.

SECONDARY DIVISION: GRADES 9-12

Overall Expectation: Physics Focus

Apply principles of physics to understand the operation and efficiency of mechanical systems.

Specific Expectation

Analyze mechanical advantage and efficiency in simple and compound machines.

Activity

Using the Walking Robot Kit, students delve into the physics behind robot locomotion. They analyze the mechanical advantage of the robot's joints and discuss how energy is transferred to achieve movement efficiently. This project provides a deeper understanding of robotics, mechanics, and the application of physics principles.

CROSS-CURRICULAR CONNECTIONS

Mathematics

Students can calculate forces and angles involved in the robot's movement.

Technology

They explore different designs and materials to optimize the robot's performance.

Language Arts

Students can write reports or presentations on the evolution of robotics and its impact on various industries.

Summary

By experimenting with the Walking Robot Kit, students engage in hands-on learning experiences that deepen their understanding of mechanical principles, robotics, and engineering concepts. This project encourages critical thinking and problem-solving, and fosters curiosity in STEM disciplines, preparing students for future technological challenges.